

THE CANADIAN METEOROLOGICAL SERVICE.

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Meteorological observations were commenced at the Toronto Magnetic Observatory in 1841 and have been carried on ever since without a break.

Prior to the autumn of 1869 however there were but few Meteorological Observers in the Dominion of Canada and there was an absence of that unity of action by which the scanty materials ^{supplied} ~~that~~ ~~did exist~~ could be combined as to yield satisfactory results. Being dissatisfied with a state of affairs so discreditable to the Meteorology of Canada and resolving that it should continue no longer Professor G.T. Kingston the Director of the Toronto Magnetic Observatory addressed himself by letter and in person to those actually engaged in Meteorological observations and also to others in various parts of the country requesting their co-operation and offering to make arrangements whereby all observations might be carried on in accordance with instructions issued by himself and might be reported to him at Toronto regularly from month to month. The result was a steady increase in the number of observers and in the exactness and regularity of the observations.

From October 1869 to the Spring of 1871 the Meteorological work of Canada was carried on by an organization that was strictly voluntary. No emoluments whatever were attached to the services of the observers and the instruments were either private property or were provided on loan from the Toronto Observatory from which establishment forms and registration were also furnished. The work of organizing new stations and of compiling returns were performed gratuitously by Professor Kingston and his assistants.

In the Spring of 1871, the Dominion Government recognized the value of these labours by a grant of \$5,000 for the promotion of Meteorological research and with a special view of preparing the

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way for establishing a system of storm signals. Early in 1872 arrangements were made for the telegraphing tri-daily reports from several stations in the Region of the Great Lakes to Toronto and these were forwarded to the Chief Signal Officer at Washington, D.C. who in return supplied Professor Kingston with reports from 15 stations in the United States. In July 1872 the annual grant was increased to \$10,000 and a steady increase was made during the next four years in the number of reporting stations and the equipment of storm signal masts.

Up to the autumn of 1876 the Canadian Service relied on the courtesy of the United States Service for storm warnings which were forwarded with regularity from Washington, whenever any serious disturbance was indicated by the Weather Chart. In September of that year, however, warnings were issued to Canadian ports without waiting for notification from the United States and in October regular daily forecasts were issued at 10, a.m. for the next 24 hours.

There are now in the Dominion 323 Meteorological Stations using instruments which have been supplied by the Government. The Observers at 245 of these stations take the observations voluntarily sending regular monthly returns to the Central Office and to these persons is due the hearty thanks of the Service. At 41 stations lying chiefly in the far northern Territories of Canada and at light houses in the Gulf of St. Lawrence, small gratuities are allowed observers. At 38 stations distributed at nearly equal intervals throughout the Dominion three or more observations are taken daily and as the observers are paid salaries, promptness and careful attention to duty is insisted upon. From 36 of these stations, two reports are daily telegraphed to Toronto to be used in the preparation of the daily weather chart.

The telegraphic reports comprise the barometer readings reduced to sea level, the readings of the wet and dry thermometers, the direction and velocity of the wind and state of the weather, the precipitation (if any), and with the morning report the minimum temperature of the pre-

-ceeding 12 hours, and with the evening report the maximum ^{temperature} of the day

~~12 hours~~. Almost invariably all reports from the stations between Lake Superior and Cape Breton are received in the Central Office by 8,30 a.m. and p.m., and are then forwarded without delay to the United States Weather Bureau at Washington from which place some 60 United States stations are in return sent to Toronto together with the Canadian reports from Manitoba westward to British Columbia which are turned over to the United States Bureau at St. Paul, Minnesota. All reports are usually received shortly after 9,30 and the working chart is ready for the forecasting official by 9,45 and by 10 o'clock the isobars have been drawn and some of the forecasts telegraphed to their destination. The bulletin issued at night comprises a short synopsis of the weather during the past day and a general description of the existing meteorological conditions; then a list of the highest and lowest temperatures reported from about a dozen stations, followed by the forecasts for the various districts lying between Manitoba and the Maritime Provinces. These forecasts are for the 24 hours beginning the following 8 a.m. unless it be expressly stated that they cover a longer period. The same evening the Telegraph Company sends the bulletin to all points where are published a morning newspaper, in which it is printed, generally at the head of the column of local news, and then in the morning on the opening of the various telegraph offices throughout the Dominion the first message which goes over the wires is the daily forecast which is posted up in a conspicuous place in every telegraph office. Up to the summer of 1894 the forecast based on the 8 a.m. chart was practically the only one issued, but since that time a second forecast covering the current and following day has been issued at 10 a.m.; this is sent to nearly all ports both on the Great Lakes and on the Seaboard and it also appears in most of the afternoon papers published in the Dominion.

There are in the Dominion 73 stations at which cautionary and storm signals are displayed, on the Lakes, in the Maritime Provinces, and 2 in British Columbia. The signals used are drums and cones the cone alone being hoisted when but a moderate gale is expected,

and both drum and cone together when it is thought that the storm will be heavy; the apex of the cone downwards indicates southerly and easterly directions, and upwards northerly and westerly.

Each morning some 85 copies of the weather chart are made by means of a duplicating machine, the Mimeograph, and supplied to the Toronto newspapers, to the Board of Trade, and to such business people who will engage to post them where they will be seen by the Public.

Arrangements have also been made with the G.N.W. Telegraph Company whereby a more comprehensive weather bulletin than is issued to the majority of places should be published each forenoon simultaneously at Quebec, Montreal, Ottawa, Hamilton and London, containing the same information as had for some time previously been published in Toronto, St. John and Halifax. This bulletin in my opinion fills all actual requirements as regards supplying such meteorological information as is possible in the present state of the science of Meteorology.

As regards the usefulness of the Service, first in importance are the warnings issued to Lake and Ocean Shipping of the approach of gales. This work is considered of great value at all fishing points, so much so that few fishermen will now take the risk of going to sea when the signals are displayed, although when the Service was first started the mariner thought himself the best weather prophet until he learnt otherwise from experience.

The long period forecasts covering two or three days and given gratis to all who ask for them, are perhaps the ^{next} most useful branch of the Service. Shippers of perishable goods, wines, ales &c., are constant enquirers as are also large slaughter and packing houses.

The bi-daily forecasts issued at 10 a.m. and 10 p.m. and published in all the newspapers as well as at all Telegraph Offices from Manitoba to the Maritime Provinces are a very important branch

